

What is claimed is:

1 1. A light projection apparatus comprising:
2 a light source adapted to project illumination along a light path;
3 dynamic patterning means interposed within the light path for forming a light pattern;
4 and
5 steering means within the light path for directing the light pattern in a desired one of a
6 plurality of controllable directions.

1 2. The apparatus of claim 1, wherein the light source includes a plurality of LEDs
2 of at least a first color and a second color adapted to provide light along the light path common
3 to said LEDs.

1 3. The apparatus of claim 2, wherein the plurality of LEDs includes a third color
2 adapted to provide light along a light path common to said LEDs.

1 4. The apparatus of claim 3, wherein the first color LED, second color LED and
2 third color LED are respectively a first primary color LED, a second primary color LED, and a
3 third primary color LED.

1 5. The apparatus of claim 2, further including intensity control means for
2 controlling the intensity of the first color and the second color of the plurality of LEDs
3 independently of one another.

1 6. The apparatus of claim 1, wherein the dynamic patterning means includes:
2 a transmissive LCD matrix interposed within the light path, said matrix comprised of a
3 plurality of pixels; and
4 means for selectively actuating the pixels to form a pattern, said pattern preventing light
5 received from said LEDs from continuing along said light path and through said pixels forming
6 said pattern to thereby form a light pattern inversely related to said pattern.

1 7. The apparatus of 6, further including memory means having a plurality of
2 different patterns stored therein.

1 8. The apparatus of claim 6, wherein said means for selectively actuating the pixels
2 includes means for addressing each pixel of the transmissive LCD matrix with two or more bits
3 of data so that each pixel is capable of passing a partial amount of light from the light source.

1 9. The apparatus of claim 8, wherein the transmissive LCD is a grayscale LCD.

1 10. The apparatus of claim 2 wherein the patterning means includes:
2 a wheel having a plurality of pattern windows formed along a periphery of the wheel;
3 and
4 a wheel axis on which the wheel is mounted for rotational movement around the axis to
5 thereby present one of the plurality of pattern windows within the light path.

1 11. The apparatus of claim 1, wherein the steering means includes a mirror having a
2 central axis at an oblique angle to the light path.

1 12. The apparatus of claim 11, further including means for tilting the mirror in a first
2 axis transverse to the mirror axis.

1 13. The apparatus of claim 12, further including means for tilting the mirror in a
2 second axis transverse to the mirror axis and the first axis.

1 14. A light projection apparatus comprising:
2 a plurality of LEDs of at least a first color and a second color adapted to provide light
3 along a light path common to said LEDs;
4 intensity control means for controlling the intensity of the first color and the second
5 color of the plurality of LEDs independently of one another;
6 a transmissive LCD matrix interposed within the light path, said matrix comprised of a
7 plurality of pixels;
8 means for selectively actuating the pixels to form a pattern, said pattern preventing light
9 received from said LEDs from continuing along said light path and through said pixels forming
10 said pattern to thereby form a light pattern inversely related to said pattern;
11 a mirror interposed within the light path to intercept said light pattern and having a
12 mirror axis at an oblique angle to said light path; and

steering means for changing the oblique angle of the mirror axis relative to said light path.

15. The apparatus of claim 14, wherein the plurality of LEDs includes a third color adapted to provide light along a light path common to said LEDs.

16. The apparatus of claim 15, wherein the first color LED, second color LED and third color LED are respectively a first primary color LED, a second primary color LED, and a third primary color LED.

17. The apparatus of claim 14, wherein said means for selectively actuating the pixels includes memory means having a plurality of different patterns stored therein.

18. A method for projecting light onto a projection surface comprising:
directing light along a light path;
displaying a selected one of a plurality of patterns on a display device interposed within the light path to form a light pattern;
reflecting the light pattern off of a mirror in a first direction;
moving the mirror; and
reflecting the light pattern off of the mirror in a second direction.

19. The method of claim 18, further including:
providing a plurality of LEDs capable of generating light along the light path of a first primary color, a second primary color, and a third primary color; and
independently regulating the intensity of light output from the LEDs for each of the first, second, and third primary colors to yield colored light.

20. The method of claim 18, wherein the step of moving the mirror includes:
tilting the mirror in a first mirror axis; and
tilting the mirror in a second mirror axis transverse to the first mirror axis.

21. The method of claim 20, wherein the step of moving the mirror further includes rotating the mirror around a third mirror axis transverse to the first and second mirror axes.

22. The method of claim 18, wherein the step of displaying a selected one of a plurality of patterns includes displaying a grayscale image on the display device.